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## Overrides of Clinical Decision Support Alerts in Primary Care Clinics

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### Abstract and Objective

Clinical Decision Support (CDS) systems can alert physicians about potential clinical risks and suggest suitable treatment alternatives at appropriate times in the health care process. We evaluated the frequency with which physicians override medication alerts and the override reasons provided. Data obtained from primary care practices affiliated with two Harvard teaching hospitals were downloaded. Physicians overrode more than half of CDS medication alerts, with formulary, age-based, and renal substitutions the most likely. Many drug-drug and drug-allergy interactions overridden had the potential to cause patient harm.

**Keywords:** Clinical decision support systems, electronic prescribing, decision-making, primary health care.

### Introduction

CDS systems can play a major role in improving the safety and quality of patient care. These systems can help prevent medication-related errors by providing physicians with real-time, relevant guidance at various stages in the health care process.<sup>1</sup> How much control physicians have over their responses to these alerts has become a key issue. Physicians continue to override CDS alerts, despite some systems being extensively modified to improve user acceptance.<sup>2</sup> The objective of this study was to evaluate the override rates for CDS alerts in primary care clinics and investigate why physicians chose to override these alerts at the time of prescribing.

### Methods

With Institutional Review Board approval, all CDS Level 2 alert overrides (which require a coded override reason) over a three-year period between January 1, 2009, and December 31, 2011 were analyzed. Our sample was limited to those providers working in primary care practices affiliated with two Harvard teaching hospitals, Massachusetts General Hospital and the Brigham and Women's Hospital (Boston, MA). Alert types included drug/ allergy interaction, drug/drug interaction, duplicate drug, age-based substitution, and renal substitution and formulary substitution. Attending physicians, residents and non-physicians with prescribing authority were included. Our primary outcome was the rate of CDS alert overrides, and secondary outcome measure the coded reasons provided by physicians at the time of prescribing.

### Results

A total of 82,899 (52.6%) of 157,483 CDS alerts were overridden during the three-year period. Those mostly likely to be overridden were formulary substitutions (85.0%), age-based substitution (79.0%), renal substitutions (78.0%), and drug-allergy (77.4%). Physicians overrode 20,430 (77.4%) of 26,408 drug-allergy alerts, with the most common reason given that "patient had taken the drug previously without allergic reaction" (53.9%). Physicians cited a variety of reasons for overriding 14,966 (60.2%) of 24,849 drug-drug alerts, the most common being that they "will monitor as recommended" (47.9%), "will adjust dose as recommended" (17.8%), and "patient has already tolerated combination" (14.0%). Table 1 gives further details on the rates of alert overrides.

Table 1-. Breakdown of alert overrides

Alert type	Alerts	Overrides	Override rate
Drug-allergy	26,408	20,430	77.4%
Drug-drug	24,849	14,966	60.2%
Drug-duplicate	75,890	22,617	29.8%
Formulary	15,945	13,554	85.0%
Aged-based	10,501	8,297	79.0%
Renal	3,890	3,035	78.0%

### Conclusion

The override rate of drug-allergy alerts was found to be higher than that of drug-drug interaction alerts and duplicate therapy alerts across the three years. Many of these alerts warn of potential significant patient harm. This novel study took a comprehensive look at six different types of CDS alerts and showed how the override reasons varied widely depending on the type of alert. Further work is needed to understand more fully the patterns and appropriateness of these override behaviours.

### References

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